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(12) **Patent disclosure**

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Application disclosed with the consent of the applicant according to § 31 Par. 2 Sect. 1 Patent Act

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(54) Resorbable, screw-on luxation retaining ring for socket components of hip prostheses

(57) Dislocation (luxation) of an artificial hip joint is one of the most frequent early complications after provision with a hip prosthesis. The resorbable luxation securing ring (A), made of the material PLLA (poly-L lactic acid), prevents dislocation during the healing phase, and is transformed into yielding connective tissue, which reduces the risk of a luxation also over the long term. That eliminates the risk of a material failure or a restriction of mobility in the hip joint, as would exist in the case of a non-resorbable substance.

[See original for diagram.]

The luxation retaining ring is screwed onto the edge of the socket component (B) with three also resorbable screws (C) (PLLA), and surrounds the prosthesis head (E) in such a way that the latter is captured by it in the socket. The luxation retaining ring has corresponding prepared bored holes (G) to receive the screws. Ring and screws are made of PLLA (poly-L lactic acid). The ring is made in thicknesses of 1/2 and 1 cm, corresponding to the dimensions of the particular socket edge. The ring covers the edge of the socket (B) with a 210-degree cutout, and thus can be placed as desired to meet all requirements.

The resorbable luxation retaining ring, made of the material PLLA (poly-L lactic acid), is suitable for all common commercial hip prosthesis socket components and socket inlays made of plastic with a wall thickness of at least 0.5 cm.

The following information is taken from documents submitted by the applicant.

Description

The invention concerns an add-on ring of PLLA (poly-L lactic acid) which is placed on the edge of socket components of hip prostheses made of plastic, using screws that are also made of PLLA.

With conventional socket components of hip prostheses which are installed in the pelvis (D), there is the danger that dislocation of the prosthesis head (E) from the socket (B) may occur. On the other hand, the luxation retaining ring surrounds the femoral head after the latter is placed in the socket and is kept in place by the screws and by way of a rounding that follows the curvature of the particular socket component or inlay. That prevents dislocation. In hip prostheses, the prosthesis head is usually anchored in the femur (F) through the prosthesis shaft. While other models of socket components or inlays of hip sockets made of a single piece sometimes have an edge that surrounds the prosthesis head (so-called snap sockets), they are for exactly that reason in significantly greater danger of becoming loose in their anchoring in the pelvis (D) because of the constant absorption of pressure during movements.

The resorbable material PLLA on the one hand eliminates the danger of a material failure (loosening/breaking of the screws or shearing of the socket ring when the prosthesis head frequently strikes the edge). On the other hand, after about 6 weeks the ring and attaching screws are transformed into flexible native connecting tissue, which provides protection against dislocations, for example in accidents or falls, even long-term.

Look-up location for PLLA: Clinical Orthopaedics and Related Research, 298, pp. 227-285, (1994), H. Pihlajamäki, O. Böstman, M. Manninen: Absorbable Plugs of Self-Reinforced Poly-L-Lactic-Acid in the Internal Fixation of Rabbit Distal Femoral Osteotomies.

The luxation retaining ring (A) includes a 210-degree circular cutout, making it possible to be fixed on the edge of a plastic socket component (B) as desired and depending on the direction of dislocation at risk. To that end it has pre-bored holes (G) to receive Phillips screws (C) with sunken heads. The ring runs out gently toward both ends, so that no step formation occurs toward the margin of the plastic socket.

The luxation retaining ring of resorbable PLLA constitutes a significant improvement over the available socket components of hip prostheses in that the risk of the typical complication of a dislocation is reduced. The resorbability and transformation into flexible native connecting tissue also results in long-term protection against dislocations, without that foreign materials of the ring remain in the body, which otherwise could fail with constant use because of their rigidity.

Description of the drawings

Figure 1: Section through the artificial hip joint with luxation retaining ring in the transverse axis of the body
Figure 2: Enlarged cutout of **Figure 1** with screw inserted
Figure 3: Side view of socket component with luxation retaining ring in position
Figure 4: Top view of socket component with luxation retaining ring in position
The meanings of the reference letters are:

A luxation retaining ring
B socket component
C screws
D pelvis
E prosthesis head
F femur
G bored holes in the ring

Claims

1. A luxation retaining ring for socket components of hip prostheses or inlays thereof made of plastic, characterized by the fact that the luxation retaining ring (A) extends the particular socket rounding and curvature and hence surrounds the artificial femoral head. The luxation retaining ring is fixed on the socket component (B) or the inlay made of plastic with screws (C) and has corresponding bored holes (G) for that purpose.

2. The luxation retaining ring as recited in Claim 1, characterized by the fact that the luxation retaining ring consists of a 210-degree cutout. The ring tapers downward toward the ends, so that no step formation occurs toward the socket component.

3. The luxation retaining ring as recited in Claim 1 or 2, characterized by the fact that luxation retaining ring and attaching screws are made of PLLA (poly-L-lactic acid), which are resorbed after about 6 weeks and transformed into connective tissue.

4. The luxation retaining ring as recited in one of Claims 1 or 2 or 3, characterized by the fact that the luxation retaining ring exists in thicknesses of ½ cm and 1 cm.

Accompanied by 1 page(s) of drawings

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[See original for drawings.]

Figure 1

Figure 2

Figure 3

Figure 4

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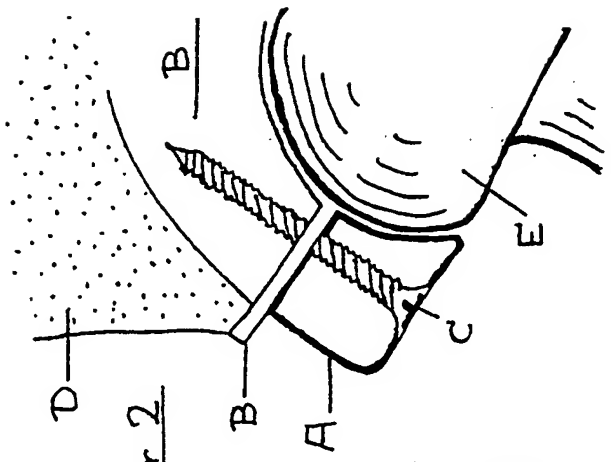
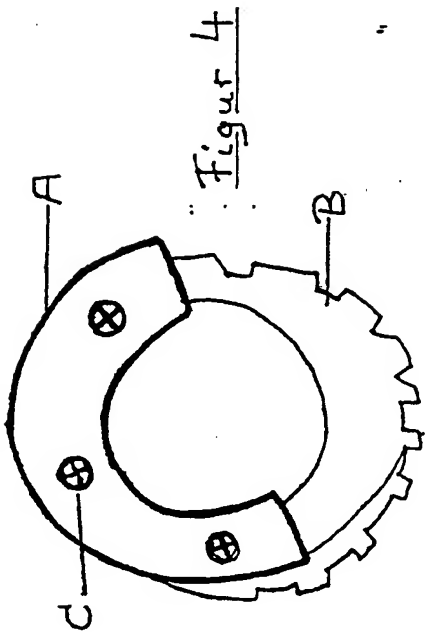
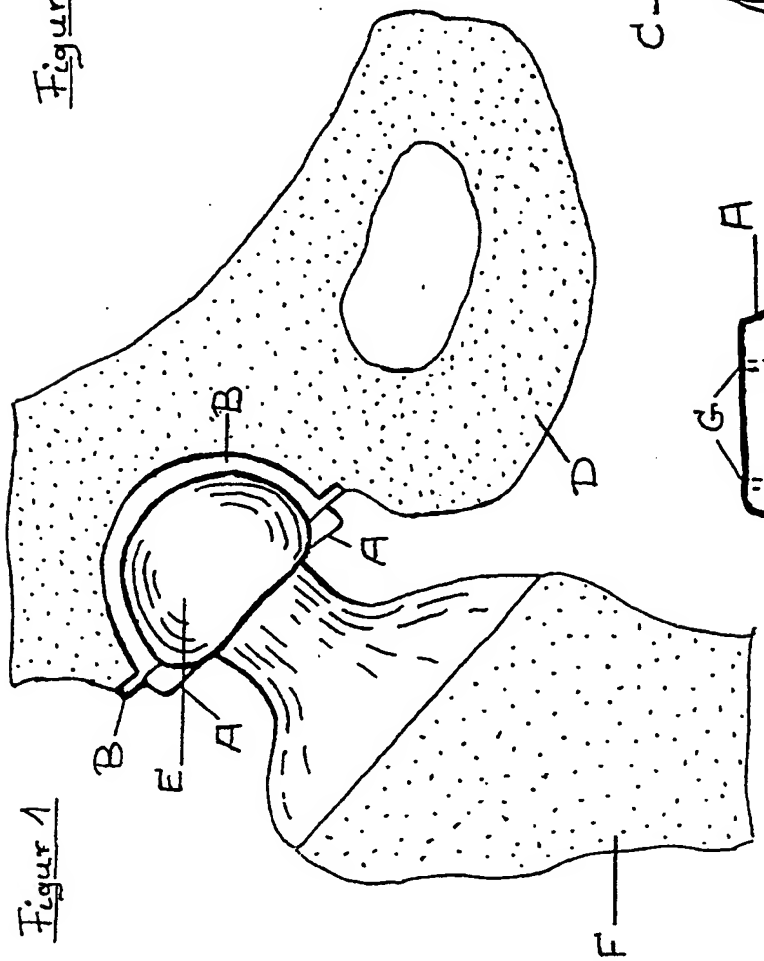


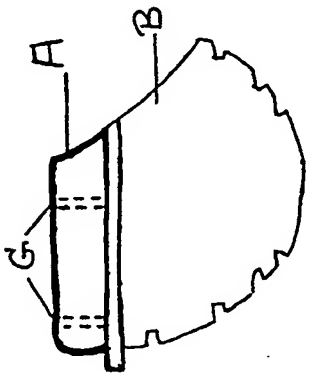
Figur 2



Figur 4



Figur 1



Figur 3